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THE TRAINING INFORMATION MANAGEMENT SYSTEM:
Phase II Evaluation Report

AD-A172 218

Perceptronics

for

ARI Field Unit at Presidio of Monterey, California

TRAINING RESEARCH LABORATORY
Jack H. Hiller, Director

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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Training Information Management System (TIMS) is a computer-based system which can be used by Army personnel to collect and display training evaluation data during field training exercises, and to generate summary evaluation reports following the exercises. The TIMS has two major subsystems: the Electronic Clip- board System (ECS), and the Training Base Station (TBS). The ECS is a hand-held electronic field training and performance evaluation aid, which contains (over) | | |

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20.Abstract (continued)

and displays performance evaluation checklists and other associated information to allow a training evaluator to record the success or failure of a soldier in meeting the standards of performance for selected tasks. The TBS is a computer-based subsystem that maintains multiple checklist databases, transfers data to and from the ECS, and generates printed and displayed summaries of training performance. It is not field-portable, but resides at a fixed location (e.g., the unit headquarters).

This research note documents an evaluation of the Training Information Management System.

The complete list of reports, of which this is volume 2, is as follows:

- RN 86-85 THE TRAINING INFORMATION MANAGEMENT SYSTEM:
Phase II Final Report
Technical and Management Overview
- RN 86-78 THE TRAINING INFORMATION MANAGEMENT SYSTEM:
Phase II Evaluation Report
- RN 86-79 THE TRAINING INFORMATION MANAGEMENT SYSTEM:
Phase II Functional Specifications
- RN 86-76 THE TRAINING INFORMATION MANAGEMENT SYSTEM:
User's Manual for the Training Base Station
- RN 86-81 THE TRAINING INFORMATION MANAGEMENT SYSTEM:
Software Design Documentation for the
Training Base Station
- RN 86-77 THE TRAINING INFORMATION MANAGEMENT SYSTEM:
User's Manual for the Electronic Clipboard System
- RN 86-82 THE TRAINING INFORMATION MANAGEMENT SYSTEM:
Software/Firmware Design Documentation for the
Electronic Clipboard System

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1.0 DOCUMENT PURPOSE AND SCOPE

The purpose of this document is to describe the Phase II Training Information Management System (TIMS) evaluation conducted at the U.S. Army Armor Center (Fort Knox, Kentucky) during the month of November 1985, and to summarize the results obtained.

This document contains six major sections:

- o 1.0 Purpose and Scope
- o 2.0 Background
- o 3.0 Description of Evaluation Process
- o 4.0 Summary of Questionnaire Responses
- o 5.0 Summary of BNCOC Evaluations
- o 6.0 Conclusions and Recommendations

2.0 BACKGROUND

The TIMS is a concept for a computer-based system that can be used by Army personnel to collect and display training evaluation data during field training exercises, and to generate summary evaluation reports following the training exercises. The TIMS evaluated at Fort Knox consisted of two subsystems: (1) The Electronic Clipboard Subsystem (ECS), a hand-held portable device to display and collect field training and evaluation data; and (2) a Training Base Station Emulator (TBSE), which configures the hand-held ECS for field operation and summarizes and prints the collected data. The Fort Knox field evaluation of TIMS was designed to allow assessment of users' opinions regarding the TIMS' current hardware and software capabilities, and collection of user's recommendations for both immediate and long-term product improvement.

3.0 DESCRIPTION OF EVALUATION PROCESS

During the evaluation, feedback was obtained from both Fort Knox Armor School Basic Non-Commissioned Officer Course (BNCOC) instructors/evaluators and a cross sample of instructors and evaluators from five other USARMC departments and courses (Training Group, Command and Staff, Weapons, Maintenance and the NCO Academy).

All subjects were familiarized with TIMS operation before they were asked to evaluate the system. All subjects received a tutorial and hands-on "user familiarization" orientation on the system. In addition, some of the BNCOC instructors/evaluators also had an opportunity to use the system in an operational environment prior to making their evaluations.

Structured questionnaires were used to obtain feedback from 30 respondents. Pre-prepared questions were presented to TIMS evaluators both in written and verbal format by an "evaluation coordinator". TIMS evaluators were asked to respond to certain of the questions by marking a 5-point rating scale. Other questions were used by the evaluation coordinator in order to aid respondents in verbalizing additional thoughts, feelings, and recommendations which might not be made explicit through the more structured rating process. All such "free form" verbalizations made by TIMS evaluators were also documented. Questionnaire responses are summarized in section 4.0.

Due to the tight time schedules of the BNCOC evaluators, it was found more expedient to extract evaluation data from them in a more free-form format, by the use of verbal questions (modeled after questions on the questionnaire) and "role playing", whereby the evaluators ran through scenarios for using the Clipboard under operational conditions and reported their thoughts and impressions as to the strengths and weaknesses of the current design. There were also BNCOC evaluators who used the Clipboard during Gunnery and Land Navigation exercises, and under day and night conditions. BNCOC evaluator responses are summarized in section 5.0.

4.0 SUMMARY OF QUESTIONNAIRE RESPONSES

TIMS evaluation information was obtained from thirty evaluators using structured questionnaires (see Appendix A for an example questionnaire). Pre-prepared questions were presented to TIMS evaluators both in written and verbal format by an "evaluation coordinator". TIMS evaluators were asked to respond to certain questions by marking a 5-point rating scale. Other questions were used by the evaluation coordinator in order to aid respondents in verbalizing additional thoughts, feelings, and recommendations. All such "free form" verbalizations were also documented and used in the subsequent analysis.

Most respondents answered all of the questions. As a rule, questions were only left unanswered where the respondents did not have an opportunity to use the TIMS under the specific conditions specified in the question.

Prior to filling out the TIMS evaluation questionnaire, respondents were asked to fill out a short "Profile Questionnaire" indicating background information such as their time in the service, current duty assignment, and previous experience with computers. Analysis of the Profile Questionnaires revealed that all but four respondents were E-6s or E-7s, and overall their previous experience with computers was limited.

In the following pages the results from the questionnaire evaluation are reported. Results are summarized and reported for each questionnaire evaluation item as follows. For each item, the evaluation item itself is listed, followed by a summary of the number of individuals responding to the particular item and the distribution of their responses on the five-point rating scale (i.e., number and percent of respondents giving each possible rating response). An interpretation of the result for the item is then made based upon consideration of the distribution of rating scale responses and upon consideration of the free-form responses, opinions, and recommendations expressed by respondents (and also recorded on the questionnaires) during the evaluation.

Clipboard Physical Configuration Questions

4.1 SIZE

4.1.1 Questionnaire Evaluation Item:

- The overall size (length, width, and thickness) was appropriate for me to use the Clipboard.

4.1.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 40% | 10% | 50% | | |
|--------------------------|------------|-----|---------------|---|--------------|
| Respondents per category | 12 | 3 | 15 | 0 | 0 |
| | Too Big | | Just Right | | Too Small |

4.1.3 Interpretation:

- Results indicate that the users believe the Clipboard is Just Right to Too Large. A significant amount of respondents indicated they would prefer a smaller unit. There was no indication that the unit is too small.

4.2 WEIGHT

4.2.1 Questionnaire Evaluation Item:

- The weight was appropriate for me to use the clipboard.

4.2.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 30% | 7% | 63% | | |
|--------------------------|-----------|----|------------|---|-----------|
| Respondents per category | 9 | 2 | 19 | 0 | 0 |
| | Too Heavy | | Just Right | | Too Light |

4.2.3 Interpretation:

- Sixty three percent of respondents indicated that the weight of the unit was Just Right for them. Even so, a significant number felt the unit was too heavy. There was no indication that the unit was too light.

4.3 EDGE SHAPE

4.3.1 Questionnaire Evaluation Item:

- The shape of the case edges was appropriate for me to use the Clipboard.

4.3.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | | | 100% | | |
|--------------------------|----------------|---|---------------|---|----------------|
| Respondents per category | 0 | 0 | 29 | 0 | 0 |
| | Too Rounded | | Just Right | | Too Angular |

4.3.3 Interpretation:

- All respondents indicated that the shape of the case edges was just right.

4.4 SURFACE TEXTURE

4.4.1 Questionnaire Evaluation Item:

- The surface texture was appropriate for me to use the Clipboard.

4.4.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | 52% | | 48% | | |
|--------------------------|------------|---|------------|---|-----------|
| Respondents per category | 15 | 0 | 14 | 0 | 0 |
| | Too Smooth | | Just Right | | Too Rough |

4.4.3 Interpretation:

- Results indicate that 52% of the respondents would prefer a rougher texture, such as a rubber case or more knurling. Respondents felt that the unit would be hard to hold under wet conditions or when the tank was on the move.

4.5 LIGHT SWITCH LOCATION

4.5.1 Questionnaire Evaluation Item:

- The **light switch** was in the appropriate location for me to use the Clipboard.

4.5.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | | | 97% | | 3% |
|--------------------------|-----------------|---|---------------|---|------------------|
| Respondents per category | 0 | 0 | 29 | 0 | 1 |
| | Too Far Left | | Just Right | | Too Far Right |

4.5.3 Interpretation:

- Results show that 97% of respondents indicated that the **light switch** is in a satisfactory location and no change is needed.

4.6 LIGHT SWITCH PRESSURE

4.6.1 Questionnaire Evaluation Item:

- The pressure of the light switch was appropriate for me to use the Clipboard.

4.6.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | | | 100% | | |
|--------------------------|--------------|---|---------------|---|--------------|
| Respondents per category | 0 | 0 | 30 | 0 | 0 |
| | Too Light | | Just Right | | Too Heavy |

4.6.3 Questionnaire Interpretation:

- All respondents indicated that the pressure on the light switch was just right.

4.7 ON SWITCH LOCATION

4.7.1 Questionnaire Evaluation Item:

- The ON switch was in the appropriate location for me to use the Clipboard.

4.7.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | | | 100% | | |
|--------------------------|-----------------|---|---------------|---|------------------|
| Respondents per category | 0 | 0 | 29 | 0 | 0 |
| | Too Far Left | | Just Right | | Too Far Right |

4.7.3 Interpretation:

- All respondents indicated that the ON switch location was in a good position and presents no problems.

4.8 ON SWITCH PRESSURE

4.8.1 Questionnaire Evaluation Item:

- The pressure of ON switch was appropriate for me to use the Clipboard.

4.8.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | | | 100% | | |
|--------------------------|--------------|---|---------------|---|--------------|
| Respondents per category | 0 | 0 | 29 | 0 | 0 |
| | Too Light | | Just Right | | Too Heavy |

4.8.3 Interpretation:

- Results indicate that all respondents had no trouble with the ON switch pressure as it currently is on the Clipboard.

4.9 CASE LABELS

4.9.1 Questionnaire Evaluation Item:

- The labels on the case were appropriate for me to use the Clipboard.

4.9.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | | | 17% | 3% | 80% |
|--------------------------|--------------------|---|-----|--------------------|-----|
| Respondents per category | 0 | 0 | 5 | 1 | 23 |
| | Hard to Understand | | | Easy to Understand | |

4.9.3 Interpretation:

- Most respondents (80%) indicated they had no problem understanding the Case Labels. Of the remaining 30%, many indicated that the labels should be on top of the unit or of different material. The majority of the comments from the 30% were not applicable to the evaluation item (hard or easy to understand) but rather appeared to represent "personal opinion" regarding label design.

4.10 BATTERY CHARGER

4.10.1 Questionnaire Evaluation Item:

- The Battery Charger was appropriate for me to charge the Clipboard batteries.

4.10.2 Questionnaire Response:

- Total number of respondents for this item: 28
- Distribution of responses:

| Percent per category | 61% | 7% | 14% | | 18% |
|--------------------------|----------|----|-----|--------------|-----|
| Respondents per category | 17 | 2 | 4 | 0 | 5 |
| | Adequate | | | Not Adequate | |

4.10.3 Interpretation:

- The results suggest that most respondents (68%) believed the battery chargers were adequate for their needs. However, 32% believed the charger was either fair, or not adequate for their needs. The majority of individuals rating the chargers other than "Adequate" indicated they would like a charger that charges faster.

Clipboard Touch Screen Configuration Questions

4.11 TOUCH AREA SIZE

4.11.1 Questionnaire Evaluation Item:

- The size of the touch areas on the display was appropriate for me to use the Clipboard.

4.11.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 7% | | 87% | 3% | 3% |
|--------------------------|-----------|---|------------|----|---------|
| Respondents per category | 2 | 0 | 26 | 1 | 1 |
| | Too Small | | Just Right | | Too Big |

4.11.3 Interpretation:

- A significant number of respondents (87%) indicated that the size of the Touch Areas was Just Right. There were no consistent reasons provided by the remaining 13% for their deviation from Just Right.

4.12 TOUCH SENSITIVITY

4.12.1 Questionnaire Evaluation Item:

- The touch screen was sensitive enough that only one touch was required to select a touch area.

4.12.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 37% | 7% | 53% | | 3% |
|--------------------------|---------------|----|------------|---|----------------------|
| Respondents per category | 11 | 2 | 16 | 0 | 1 |
| | Too Sensitive | | Just Right | | Not Sensitive Enough |

4.12.3 Interpretation:

- The majority of respondents (53%) believed the sensitivity was Just Right. Another 44% believed the touch screen was Too Sensitive. The most common problems were when they accidentally touched the screen, or when moving their finger to a touch area, they accidentally selected another area. Several respondents suggested touch panels such as those on many new microwaves.

4.13 TOUCH KEY ARRANGEMENT

4.13.1 Questionnaire Evaluation Item:

- The arrangement of the touch keys was appropriate for me to use the Clipboard.

4.13.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | | | 13% | 3% | 84% |
|--------------------------|----------------|---|-----|----|----------------|
| Respondents per category | 0 | 0 | 4 | 1 | 25 |
| | Hard To Use | | | | Easy To Use |

4.13.3 Interpretation:

- A majority of respondents (84%) found the Touch Key Arrangement to be Easy To Use. The remaining 16% indicated that the arrangement was between Fair to Easy To Use. A few respondents indicated that more training on the Clipboard would help. In general, most felt the arrangement was adequate and logical.

4.14 TOUCH SCREEN MENUS (UNDERSTANDABILITY)

4.14.1 Questionnaire Evaluation Item:

- The menus presented on the touch screen were appropriate for me to use the Clipboard operating modes and databases.

4.14.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | 90% | 3% | 7% | | |
|--------------------------|--------------------|----|----|--------------------|---|
| Respondents per category | 26 | 1 | 2 | 0 | 0 |
| | Easy to Understand | | | Hard to Understand | |

4.14.3 Interpretation:

- The majority of respondents (90%) found the Menus to be Easy to Understand when using the Clipboard operating modes and databases. The remaining 10% indicated a need for more training.

4.15 TOUCH SCREEN MENUS (USEABILITY)

4.15.1 Questionnaire Evaluation Item:

- The menus presented on the touch screen were clear and understandable, and appropriate for me to access the Clipboard operating modes and databases.

4.15.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | | 3% | 10% | 7% | 80% |
|--------------------------|----------------|----|-----|----|----------------|
| Respondents per category | 0 | 1 | 3 | 2 | 24 |
| | Hard To Use | | | | Easy To Use |

4.15.3 Interpretation:

- The majority of respondents (80%) found the Menus Easy and Useable. Another 17% found the Menus Fair to Easy and 3% experienced trouble using the menus. Overall, results indicate the Menus are Easy To Use.

Clipboard Display Questions

4.16 BRIGHTNESS

4.16.1 Questionnaire Evaluation Item:

- The display brightness was appropriate for me to use the Clipboard.

4.16.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | 3% | 10% | 63% | 3% | 21% |
|--------------------------|---------------|-----|---------------|----|------------|
| Respondents per category | 1 | 3 | 18 | 1 | 6 |
| | Too Bright | | Just Right | | Too Dim |

4.16.3 Interpretation:

- Responses for this item varied across the entire scale. Most respondents (63%) indicated that display brightness was Just Right. However, 37% of respondents were not totally pleased with the brightness. The majority of their comments focus on a problem with glare from the sun. At certain angles, or under certain sunlight conditions, they had a problem reading the display.

4.17 LETTER SIZE

4.17.1 Questionnaire Evaluation Item:

- The size of the letters and numbers on the display was appropriate for me to use the Clipboard.

4.17.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 3% | | 87% | 3% | 7% |
|--------------------------|-----------|--|------------|----|---------|
| Respondents per category | 1 | | 26 | 1 | 2 |
| | Too Small | | Just Right | | Too Big |

4.17.3 Interpretation:

- The majority (87%) of respondents indicated that letter size was Just Right. Of the 10% that felt the letters were Too Big, there was an indication from their comments that they wanted more information on the display, thus, smaller letters would provide the ability to display more information.

4.18 DISPLAY LEGIBILITY (DAYLIGHT)

4.18.1 Questionnaire Evaluation Item:

- The legibility of the text and characters shown on the display was appropriate for me to use the Clipboard during the day.

4.18.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 13% | 13% | 17% | | 57% |
|--------------------------|-------------|-----|-----|---|--------------|
| Respondents per category | 4 | 4 | 5 | 0 | 17 |
| | Not Legible | | | | Very Legible |

4.18.3 Interpretation:

- Results vary across the scale for this item. More than half of the respondents had no problem with the legibility of the display. A significant number of respondents indicated that display legibility was inadequate. Some attributed it to glare from the sun, and others indicated a true need for more letter/background contrast.

4.19 DISPLAY LEGIBILITY (NIGHTTIME)

4.19.1 Questionnaire Evaluation Item:

- The legibility of the text and characters shown on the display was appropriate for me to use the Clipboard at night.

4.19.2 Questionnaire Response:

- Total number of respondents for this item: 22
- Distribution of responses:

| Percent per category | 9% | | 14% | | 77% |
|--------------------------|-------------|---|-----|--------------|-----|
| Respondents per category | 2 | 0 | 3 | 0 | 17 |
| | Not Legible | | | Very Legible | |

4.19.3 Interpretation:

- Under night-time conditions most (77%) believed that display legibility was Very Legible. Nine percent felt it was Not Legible.

Clipboard Function Questions

4.20 ID THE EVALUATOR

4.20.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to identify the evaluator(s).

4.20.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | | | 3% | 3% | 94% |
|--------------------------|---------------------|---|----|----|----------------|
| Respondents per category | 0 | 0 | 1 | 1 | 28 |
| | Difficult To Use | | | | Easy To Use |

4.20.3 Interpretation:

- Results indicate that the ID The Evaluator function is adequate and Easy To Use.

4.21 ID THE STUDENT

4.21.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to identify the student(s).

4.21.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 4% | | 6% | | 90% |
|--------------------------|---------------------|---|----------------|---|-----|
| Respondents per category | 1 | 0 | 2 | 0 | 27 |
| | Difficult To Use | | Easy To Use | | |

4.21.3 Interpretation:

- Results indicate that the ID The Student function is adequate and Easy To Use.

4.22 ID THE DRILL

4.22.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to identify the drill(s).

4.22.2 Questionnaire Response:

- Total number of responses for this item: 30
- Distribution of responses:

| Percent per category | | | 3% | | 97% |
|--------------------------|---------------------|---|----|---|----------------|
| Respondents per category | 0 | 0 | 1 | 0 | 29 |
| | Difficult To Use | | | | Easy To Use |

4.22.3 Interpretation:

- Results indicate that the ID The Drill function is adequate and Easy To Use.

4.23 TRAIN ON A DRILL

4.23.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to train the drill(s) in the field.

4.23.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | 3% | | 7% | | 90% |
|--------------------------|---------------------|---|----|----------------|-----|
| Respondents per category | 1 | 0 | 2 | 0 | 26 |
| | Difficult To Use | | | Easy To Use | |

4.23.3 Interpretation:

- Results indicate that the Train On A Drill function is perceived to be adequate and Easy to Use in a field environment.

4.24 EVALUATE A DRILL

4.24.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to evaluate the drill(s) in the field.

4.24.2 Questionnaire Response:

- Total number of responses for this item: 28
- Distribution of responses:

| Percent per category | 3% | | | 3% | 94% |
|--------------------------|---------------------|---|---|----------------|-----|
| Respondents per category | 1 | 0 | 0 | 1 | 26 |
| | Difficult To Use | | | Easy To Use | |

4.24.3 Interpretation:

- Results indicate that the Evaluate A Drill function is perceived to be adequate and Easy to Use in a field environment.

4.25 REVIEW A PASS

4.25.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to review the student(s) scores.

4.25.2 Questionnaire Response:

- Total number of responses for this item: 29
- Distribution of responses:

| Percent per category | | | 7% | | 93% |
|--------------------------|---------------------|---|----|----------------|-----|
| Respondents per category | 0 | 0 | 2 | 0 | 27 |
| | Difficult To Use | | | Easy To Use | |

4.25.3 Interpretation:

- Results indicate that the Review A Pass function is adequate and Easy To Use.

4.26 ENTRY CORRECTION/CANCELLATION

4.26.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to correct or cancel any entries that I made.

4.26.2 Questionnaire Response:

- Total number of responses for this item: 30
- Distribution of responses:

| Percent per category | 3% | | 7% | | 90% |
|--------------------------|---------------------|---|----------------|---|-----|
| Respondents per category | 1 | 0 | 2 | 0 | 27 |
| | Difficult To Use | | Easy To Use | | |

4.26.3 Interpretation:

- Results indicate that the Entry Correction/Cancellation function is Easy To Use.

4.27 SCROLL UP/DOWN

4.27.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to scroll up and down within a list.

4.27.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | 4% | | 13% | | 83% |
|--------------------------|---------------------|---|-----|----------------|-----|
| Respondents per category | 1 | 0 | 4 | 0 | 25 |
| | Difficult To Use | | | Easy To Use | |

4.27.3 Interpretation:

- Results indicate that the Scroll function was Easy To Use.

4.28 GONO GONOT SEENNOT DONE

4.28.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to identify the tasks that were GO, NO GO, NOT SEEN, OR NOT DONE.

4.28.2 Questionnaire Response:

- Total number of respondents for this item: 30
- Distribution of responses:

| Percent per category | | | 3% | 3% | 94% |
|--------------------------|---------------------|---|----|----|----------------|
| Respondents per category | 0 | 0 | 1 | 1 | 28 |
| | Difficult To Use | | | | Easy To Use |

4.28.3 Interpretation:

- Results indicate that the Go/No Go/Not Seen/Not Done function was Easy To Use.

4.29 STOPWATCH (USEABILITY)

4.29.1 Questionnaire Evaluation Item:

- The stopwatch function was appropriate for me to time events.

4.29.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | | | 7% | | 93% |
|--------------------------|---------------------|---|----|----------------|-----|
| Respondents per category | 0 | 0 | 2 | 0 | 27 |
| | Difficult To Use | | | Easy To Use | |

4.29.3 Interpretation:

- The results indicate that the Stopwatch function is Easy To Use.

4.30 STOPWATCH (ADEQUACY)

4.30.1 Questionnaire Evaluation Item:

- The Stopwatch function was appropriate for me to time events.

4.30.2 Questionnaire Response:

- Total number of respondents for this item: 28
- Distribution of responses:

| | | | | | |
|--------------------------|----------|---|----|--------------|-----|
| Percent per category | 82% | | 4% | | 14% |
| Respondents per category | 23 | 0 | 1 | 0 | 4 |
| | Adequate | | | Not Adequate | |

4.30.3 Interpretation:

- Results indicate that the Stopwatch function was adequate for its use. However, some respondents expressed the desire for the Stopwatch function to include the ability to enter a specific time and have the unit count-down that time.

4.31 OPERATING TIME REMAINING

4.31.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to determine the operating time remaining.

4.31.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | 17% | | | | 83% |
|--------------------------|---------------------|---|---|----------------|-----|
| Respondents per category | 5 | 0 | 0 | 0 | 24 |
| | Difficult To Use | | | Easy To Use | |

4.31.3 Interpretation:

- Overall, results indicate that the Operating Time Remaining function is Easy To Use. Comments from those who stated they had difficulty using this function concerned such issues as a need for longer battery life or the ease with which one could "fool" the Time Remaining display, rather than difficulty using the Operating Time Remaining function.

4.32 DATE/TIME

4.32.1 Questionnaire Evaluation Item:

- The Clipboard functions were appropriate for me to use the calendar and clock.

4.32.2 Questionnaire Response:

- Total number of responses for this item: 30
- Distribution of responses:

| Percent per category | | | 7% | | 93% |
|--------------------------|---------------------|---|----|----------------|-----|
| Respondents per category | 0 | 0 | 2 | 0 | 28 |
| | Difficult To Use | | | Easy To Use | |

4.32.3 Interpretation:

- Results indicate that the Date/Time function was Easy To Use.

5.33 AUTOMATIC OFF

5.33.1 Questionnaire Evaluation Item:

- The display turns off automatically after 3 minutes if no key is pressed. This function was adequate for me to use the Clipboard.

4.33.2 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | | | 7% | 3% | 90% |
|--------------------------|---------------------------|---|----------------------------------|----|-----|
| Respondents per category | 0 | 0 | 2 | 1 | 26 |
| | Interfered with my job | | Did Not Interfere with my job | | |

4.33.3 Interpretation:

- Results indicate that the Automatic Off function did not interfere with the respondent's job. There was a 10% deviation from that statement but no consistent reasons were provided.

Overall Useability Questions

Questionnaire Evaluation Item: Please rate the overall useability of the Clipboard under the following conditions:

4.34 DAYTIME

4.34.1 Questionnaire Response:

- Total number of respondents for this item: 29
- Distribution of responses:

| Percent per category | 52% | 21% | 17% | 7% | 3% |
|--------------------------|---------------------|-----|-----|--------------------------|----|
| Respondents per category | 15 | 6 | 5 | 2 | 1 |
| | Very Easy to Use | | | Very Difficult to Use | |

4.34.2 Interpretation:

- Results indicate that most respondents (52%) believed the Clipboard was Very Easy to Use under daylight conditions. Results from the remaining 48% spread across the scale. Comments from the respondents indicate that glare from the sun caused the display to be difficult to read at times.

4.35 NIGHTTIME

4.35.1 Questionnaire Response:

- Total number of respondents for this item: 25
- Distribution of responses:

| Percent per category | 48% | 32% | 4% | 4% | 12% |
|--------------------------|---------------------|-----|----|--------------------------|-----|
| Respondents per category | 12 | 8 | 1 | 1 | 3 |
| | Very Easy to Use | | | Very Difficult to Use | |

4.35.2 Interpretation:

- Most respondents (80%) found the Clipboard Easy to Very Easy to Use under nighttime conditions. Some respondents indicated that the unit was too bright at night and that the user should have the ability to turn the light OFF and ON.

4.36 EVALUATING MOBILE FORCES

4.36.1 Questionnaire Response:

- Total number of respondents for this item: 24
- Distribution of responses:

| Percent per category | 58% | 4% | 13% | 4% | 21% |
|--------------------------|---------------------|----|-----|--------------------------|-----|
| Respondents per category | 14 | 1 | 3 | 1 | 5 |
| | Very Easy to Use | | | Very Difficult to Use | |

4.36.2 Interpretation:

- The majority of respondents indicated that they perceived the Clipboard would be Very Easy to Use while evaluating mobile force. The remaining Results vary across the remainder of the scale. Comments from some respondents indicate that they felt the Clipboard might be difficult to use while in a vehicle in motion.

4.37 EVALUATING STATIONARY FORCES

4.37.1 Questionnaire Response:

- Total number of respondents for this item: 26
- Distribution of responses:

| Percent per category | 85% | 12% | | | 3% |
|--------------------------|---------------------|-----|---|--------------------------|----|
| Respondents per category | 22 | 3 | 0 | 0 | 1 |
| | Very Easy to Use | | | Very Difficult to Use | |

4.37.2 Interpretation:

- Results indicate that the Clipboard is perceived to be Easy to Use for evaluating stationary forces.

4.38 EVALUATING DISCRETE EVENTS

4.38.1 Questionnaire Response:

- Total number of respondents for this item: 27
- Distribution of responses:

| Percent per category | 74% | 15% | 4% | | 7% |
|--------------------------|---------------------|-----|----|--------------------------|----|
| Respondents per category | 20 | 4 | 1 | 0 | 2 |
| | Very Easy to Use | | | Very Difficult to Use | |

4.38.2 Interpretation:

- Results indicate that the Clipboard is Easy to use while evaluating discrete events.

4.39 EVALUATING EVENTS IN A SERIES OF OTHER EVENTS

4.39.1 Questionnaire Response:

- Total number of respondents for this item: 25
- Distribution of responses:

| Percent per category | 76% | 12% | 8% | | 4% |
|--------------------------|---------------------|-----|----|--------------------------|----|
| Respondents per category | 19 | 3 | 2 | 0 | 1 |
| | Very Easy to Use | | | Very Difficult to Use | |

4.39.2 Interpretation:

- Results indicate that most respondents (76%) believed that the Clipboard was Very Easy to Use.

4.40 FIELD ENVIRONMENT

4.40.1 Questionnaire Response:

- Total number of respondents for this item: 18
- Distribution of responses:

| Percent per category | 28% | 17% | 17% | 33% | 5% |
|--------------------------|-----|-----|--------------------------|-----|----|
| Respondents per category | 5 | 3 | 3 | 6 | 1 |
| Very Easy to Use | | | Very Difficult to Use | | |

4.40.2 Interpretation:

- Results indicate that there are no consistent trends in user's perceptions of the difficulty of using the Clipboard in a field environment. What the comments and results do suggest is that some respondents believe that the Clipboard would be difficult to use in the field. Many suggested that either a handle or some type of grip would be useful. Others felt the unit was not sufficiently ruggedized, and that the casing should be made of a different material (e.g., rubber or aluminum). Still others indicated that for use in the field environment the openings around the plug, ON switch, and LIGHT switch would need to be sealed.

Training Base Station Function Questions

4.41 SET ECS INITIAL CONDITIONS (ENTER EVALUATOR NAMES)

4.41.1 Questionnaire Evaluation Item:

- The Training Base Station functions were appropriate for me to set the initial conditions - Enter Evaluator Names.

4.41.2 Questionnaire Response:

- Total number of respondents for this item: 22
- Distribution of responses:

| Percent per category | | | 4% | 4% | 92% |
|--------------------------|---------------------|---|----|----|----------------|
| Respondents per category | 0 | 0 | 1 | 1 | 20 |
| | Difficult to Use | | | | Easy to Use |

4.41.3 Interpretation:

- Results indicate that the Enter Evaluator Names function was Easy to Use.

4.42 SET ECS INITIAL CONDITIONS (ENTER SOLDIER NAMES)

4.42.1 Questionnaire Evaluation Item:

- The Training Base Station functions were appropriate for me to set the initial conditions - Enter Soldier Names.

4.42.2 Questionnaire Response:

- Total number of responses for this item: 23
- Distribution of responses:

| Percent per category | | | 9% | 4% | 87% |
|--------------------------|---------------------|---|----|----------------|-----|
| Respondents per category | 0 | 0 | 2 | 1 | 20 |
| | Difficult to Use | | | Easy to Use | |

4.42.3 Interpretation:

- Results indicate that the Enter Soldier Names function is Easy to Use.

4.43 SELECT ECS INITIAL CONDITIONS (SELECT TRAINING GUIDE)

4.43.1 Questionnaire Evaluation Item:

- The Training Base Station functions were appropriate for me to set the initial conditions - Select Training Guide.

4.43.2 Questionnaire Response:

- Total number of respondents for this item: 24
- Distribution of responses:

| Percent per category | | | 4% | 4% | 92% |
|--------------------------|---------------------|---|----|----|----------------|
| Respondents per category | 0 | 0 | 1 | 1 | 22 |
| | Difficult to Use | | | | Easy to Use |

4.43.3 Interpretation:

- Results indicate that the Select Training Guide function is Easy to Use.

4.44 DIAGNOSE ECS STATUS

4.44.1 Questionnaire Evaluation Item:

- The Training Base Station functions were appropriate for me to diagnose the ECS operational status.

4.44.2 Questionnaire Response:

- Total number of respondents for this item: 23
- Distribution of responses:

| Percent per category | | | 4% | | 96% |
|--------------------------|---------------------|---|----|----------------|-----|
| Respondents per category | 0 | 0 | 1 | 0 | 22 |
| | Difficult to Use | | | Easy to Use | |

4.44.3 Interpretation:

- Results indicate that the Diagnose ECS Status function is Easy to Use.

4.45 TRANSFER ECS CONDITIONS TO CLIPBOARD

4.45.1 Questionnaire Evaluation Item:

- The Training Base Station functions were appropriate for me to transfer the initial conditions to the Electronic Clipboard.

4.45.2 Questionnaire Response:

- Total number of respondents for this item: 24
- Distribution of responses:

| Percent per category | | | | 4% | 96% |
|--------------------------|---------------------|---|---|----------------|-----|
| Respondents per category | 0 | 0 | 0 | 1 | 23 |
| | Difficult to Use | | | Easy to Use | |

4.45.3 Interpretation:

- Results indicate that the Transfer ECS Conditions To Clipboard function is Easy to Use.

4.46 UPLOAD TRAINING DATA

4.46.1 Questionnaire Evaluation Item:

- The Training Base Station functions were appropriate for me to upload scores from the Clipboard.

4.46.2 Questionnaire Response:

- Total number of respondents for this item: 22
- Distribution of responses:

| Percent per category | | | | | 100% |
|--------------------------|---------------------|---|---|----------------|------|
| Respondents per category | 0 | 0 | 0 | 0 | 22 |
| | Difficult to Use | | | Easy to Use | |

4.46.3 Interpretation:

- Results indicate that the Upload Training Data function is Easy to Use.

4.47 DISPLAY OF SUMMARY REPORTS

4.47.1 Questionnaire Evaluation Item:

- The displayed presentation of summary score reports was appropriate for me to do my job.

4.47.2 Questionnaire Response:

- Total number of respondents for this item: 18
- Distribution of responses:

| Percent per category | | | | | 100% |
|--------------------------|---------------------|---|---|----------------|------|
| Respondents per category | 0 | 0 | 0 | 0 | 18 |
| | Difficult to Use | | | Easy to Use | |

4.47.3 Interpretation:

- Results indicate that the Display of Summary Report is Easy to Use.

4.48 ENTRY CORRECTION/CANCELLATION

4.48.1 Questionnaire Evaluation Item:

- The Training Base Station functions were appropriate for me to correct or cancel any entries that I made.

4.48.2 Questionnaire Response:

- Total number of respondents for this item: 22
- Distribution of responses:

| Percent per category | 4% | 4% | 92% | | |
|--------------------------|-----------------|----|------------|--------------|---|
| Respondents per category | 1 | 1 | 20 | 0 | 0 |
| | Too Complicated | | Just Right | Very Unclear | |

4.48.3 Interpretation:

- Results indicate that the Entry Correction/Cancellation functions was Easy to Use.

4.49 ECS - TBS CONNECTION

4.49.1 Questionnaire Evaluation Item:

- The connection between the Electronic Clipboard and the Training Base Station was appropriate for me to successfully connect the two devices.

4.49.2 Questionnaire Response:

- Total number of respondents for this item: 24
- Distribution of responses:

| Percent per category | | 4% | 92% | | 4% |
|--------------------------|--------------------|----|---------------|---|-----------------|
| Respondents per category | 0 | 1 | 22 | 0 | 1 |
| | Too Complicated | | Just Right | | Very Unclear |

4.49.3 Interpretation:

- Results indicate that the ECS - TBS Connection is Easy to Use.

4.50 TBS MENU OPTIONS (USEABILITY)

4.50.1 Questionnaire Evaluation Item:

- The Training Base Station menu options were appropriate for me to do my job.

4.50.2 Questionnaire Response:

- Total number of respondents for this item: 23
- Distribution of responses:

| Percent per category | | 9% | 9% | 4% | 78% |
|--------------------------|---------------------|----|----|----|----------------|
| Respondents per category | 0 | 2 | 2 | 1 | 18 |
| | Difficult to Use | | | | Easy to Use |

4.50.3 Interpretation:

- Most respondents (78%) believed the TBS Menu Options were Easy to Use. Some of those that had difficulty, indicated more training would be helpful.

4.51 TBS MENU OPTIONS (ADEQUACY)

4.51.1 Questionnaire Evaluation Item:

- The Training Base Station menu options were appropriate for me to select the options I wanted.

4.51.2 Questionnaire Response:

- Total number of respondents for this item: 21
- Distribution of responses:

| Percent per category | 81% | 5% | 9% | | 5% |
|--------------------------|----------|----|----|--------------|----|
| Respondents per category | 17 | 1 | 2 | 0 | 1 |
| | Adequate | | | Not Adequate | |

4.51.3 Interpretation:

- Most respondents indicated that the Menu Options were Adequate for their needs. The individual that found the options somewhat inadequate provided no comments to clarify his rating.

5.0 SUMMARY OF BNCOC EVALUATION

Due to the tight time schedules of the BNCOC evaluators, it was found more expedient to extract evaluation data from them in a more free-form format, by the use of verbal questions (modeled after questions on the questionnaire) and "role playing", whereby the evaluators ran through scenarios for using the Clipboard under operational conditions and reported their thoughts and impressions as to the strengths and weaknesses of the current design. There were also BNCOC evaluators who used the Clipboard during Gunnery and Land Navigation exercises, and under day and night conditions. BNCOC evaluator recommendations are summarized below:

- o Provide faster scroll
- o Use non-glare surface on display
- o Provide positive feedback on keyboard (so user can tell when a key has been pressed)
- o Develop more ruggedized package
 - o Include RF shielding
 - o Make sure all switches and connectors are sealed (i.e., against dirt and moisture)
 - o Make case scratch resistant
 - o Make case fingerprint resistant
 - o Make unit more resistant to damage due to environmental and handling factors (e.g., temperature, humidity, drop)
 - o Increase brightness of display (for daytime use)
 - o Provide capability to charge unit off of DC power supply
- o Add a numeric keypad

- o Link Train on Drill and Evaluate a Drill modes in such a way that user can go rapidly back and forth between them without losing his place
- o Do not automatically route user into next unscored pass each time Train On Drill mode is requested. Make soldier indicate that he has completed a pass before he can access the next pass.
- o Consider making time for backlight timeout selectable
- o Consider adding a software dimmer switch for the backlight
- o Improve the means of indicating when a given key selection has been made (e.g., use flashing of entire key selected, or inverse video)
- o Find a better name for the function "Get More Words"
- o Make error messages more obvious
- o Show student name and pass number at all times in the Evaluate a Drill mode
- o Add an "OFF" switch capability for the backlight (e.g., toggle the Light switch)
- o Provide an "intelligent" battery charger so there will be no worry about overcharging
- o Provide a battery charger capable of providing a full charge to the Clipboard in under eight hours
- o Make the scroll arrows more visible
- o Add a "clock option" to the TBS so that the date and time passed to the Clipboard will be accurate and consistent across users, and not dependent upon the entry of date and time by each individual user

- o Consider adding a "set marker" function that will allow users to define their own places in the database to which they can rapidly jump
- o Consider making the unit smaller and lighter
- o Provide a cap for the RS-232 connector
- o Make the unit easier to hold on to (e.g., add handle or holster; change surface texture to make unit easier to hold on to)
- o Make it possible to change batteries in the field
- o Increase Clipboard memory retention time (so will retain scores more than five days)
- o Increase Clipboard memory so Clipboard can store multiple training guides

6.0 CONCLUSIONS AND RECOMMENDATIONS

It is not the purpose of this section to recommend a design for a new improved version of the Clipboard and the Training Base Station, but rather to recommend features to be considered in any new design effort based upon knowledge gained during the Fort Knox TIMS field evaluation. Such features are presented below in two categories:

- o Those considered to be very important to include in a new design
- o Those considered important for future consideration but optional for the next generation design (i.e., not absolutely essential)

It is important to realize that some features may interact or be mutually exclusive and such issues must be addressed during any future design efforts.

6.1 Essential Features to Include In Future Designs

- o High contrast display
- o Positive feedback on touch panel (so user can tell when keys have been pressed)
- o Increased ruggedization
- o Faster scroll
- o Link Train on Drill and Evaluate a Drill modes in such a way that user can go rapidly back and forth between them without losing his place
- o Do not automatically route user into next unscored pass each time Train On Drill mode is requested. Make soldier indicate that he has completed a pass before he can access the next pass.
- o Improve the means of indicating when a given key selection has been made (e.g., use flashing of entire key selected, or inverse video)

- o Show student name and pass number at all times in the Evaluate a Drill mode
- o Add an "OFF" switch capability for the backlight (e.g., toggle the Light switch)

6.2 Optional Features for Next Generation Design

- o Increase Clipboard memory retention time from five days to over one month
- o Provide intensity control for electroluminescent backlight
- o Make batteries field replaceable
- o Increase Clipboard memory so Clipboard can store multiple training guides simultaneously
- o Provide a capability to charge Clipboard from a DC power source
- o Add a numeric keyboard (software keys)
- o Improve the means of indicating when a given key selection has been made (e.g., use flashing of entire key selected, or inverse video)
- o Make displayed error messages more obvious
- o Add a "set marker" function that will allow users to define their own places in the database to which they can rapidly jump

In addition to the above, the following recommendations for improvements are made by the developers (Perceptronics):

- o Consider adding a capability to download not only databases but also applications programs to the Clipboard. This will allow the Clipboard to be easily configured to support multiple requirements.
- o Consider rehosting the Training Base Station onto other computers currently in use by major user communities.

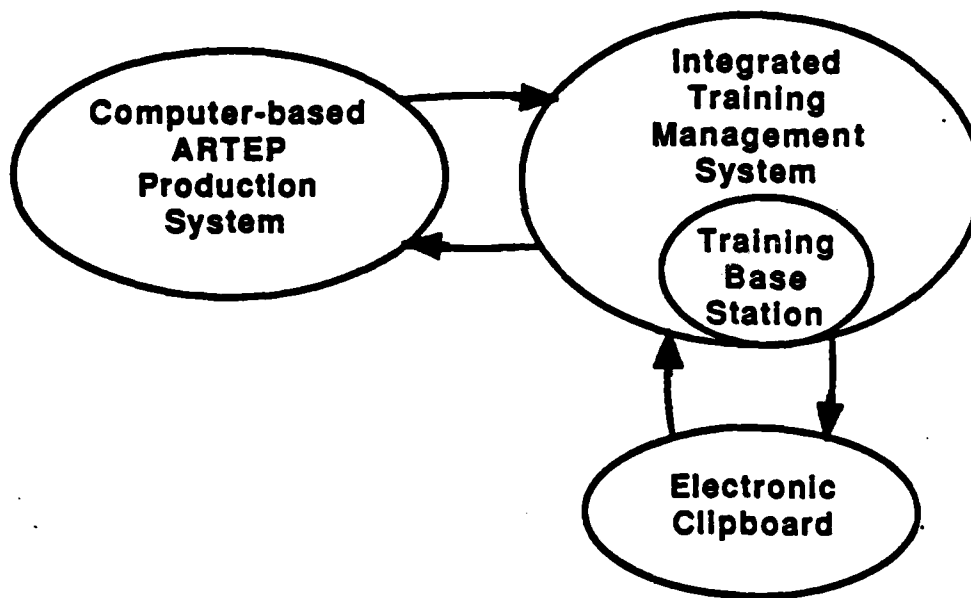
APPENDIX A

SAMPLE QUESTIONNAIRE

Training Information Management System (TIMS)

Evaluation Questionnaire

TIMS is designed to be part of a larger Army training management system, in which data (e.g., student scores, training time) gathered during a training course can be used not only for evaluation of the individual students in the course, but also as feedback to the course developers for improving the course itself. The following diagram depicts the envisioned Army training management system in which the TIMS, with its Electronic Clipboard and Training Base Station components, provides a "field data collection capability". The TIMS is the first part of the larger training management system to be developed.



The purpose of this Questionnaire is to determine how well the TIMS (including the Electronic Clipboard and the Training Base Station) works for collecting, storing, and summarizing training data during a training course. Your responses to this questionnaire will help the developers of TIMS to improve the system.

Your responses will be kept confidential, and no records will be kept that can be associated with you or your personnel records. When you answer the "Biographical Questionnaire," you need not include any information that identifies you personally.

A series of statements regarding various aspects of the TIMS are presented on the following pages. A TIMS evaluator will discuss each of the statements with you, and ask you to place an "X" along a scale indicating your degree of agreement or disagreement with each statement. The TIMS evaluator may also ask you questions designed to help you express your opinions in greater detail.

Clipboard Physical Configuration

Size -

The overall size (length, width, and thickness) was appropriate for me to use the Clipboard.

| | | | | |
|---------|--|------------|--|-----------|
| | | | | |
| Too Big | | Just Right | | Too Small |

If the Size was not Just Right, please explain how it should be different:

Weight -

The weight was appropriate for me to use the Clipboard.

| | | | | |
|-----------|--|------------|--|-----------|
| | | | | |
| Too Heavy | | Just Right | | Too Light |

If the Weight was not Just Right, please explain how it should be different:

Clipboard Physical Configuration (continued)

Edge Shape -

The shape of the case edges was appropriate for me to use the Clipboard.

| | | | | |
|-------------|--|------------|--|-------------|
| | | | | |
| Too Rounded | | Just Right | | Too Angular |

If the Shape of the Edges was not Just Right, please explain how it should be different:

Surface Texture -

The surface texture was appropriate for me to use the Clipboard.

| | | | | |
|------------|--|------------|--|-----------|
| | | | | |
| Too Smooth | | Just Right | | Too Rough |

If the Surface Texture was not Just Right, please explain how it should be different:

Clipboard Physical Configuration (continued)

Light Switch location- The light switch was in the appropriate location for me to use the Clipboard.

| | | | | |
|--------------|-------|------------|-------|---------------|
| _____ | _____ | _____ | _____ | _____ |
| Too Far Left | | Just Right | | Too Far Right |

If the Light Switch location was not Just Right, please explain how it should be different:

Light Switch pressure - The pressure of light switch was appropriate for me to use the Clipboard.

| | | | | |
|-----------|-------|------------|-------|-----------|
| _____ | _____ | _____ | _____ | _____ |
| Too Light | | Just Right | | Too Heavy |

If the Light Switch pressure was not Just Right, please explain how it should be different:

Clipboard Physical Configuration (continued)

ON Switch location-

The ON switch was in the appropriate location for me to use the Clipboard.

| | | | | |
|--------------|--|------------|--|---------------|
| | | | | |
| Too Far Left | | Just Right | | Too Far Right |

If the ON Switch location was not Just Right, please explain how it should be different:

ON Switch pressure -

The pressure of ON switch was appropriate for me to use the Clipboard.

| | | | | |
|-----------|--|------------|--|-----------|
| | | | | |
| Too Light | | Just Right | | Too Heavy |

If the ON Switch pressure was not Just Right, please explain how it should be different:

Clipboard Physical Configuration (continued)

Case Labels -

The labels on the case were appropriate for me to use the Clipboard.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Hard to Understand Easy to Understand

If the Case Labels were not Easy to Understand, please explain how they should be different:

Battery Charger -

The Battery Charger was appropriate for me to charge the Clipboard batteries.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Adequate Not Adequate

If the Battery Charger was not Adequate, please explain how it should be different:

Clipboard Touch Screen Configuration

Touch Area Size - The size of the touch areas on the display was appropriate for me to use the Clipboard.

| | | | | |
|-----------|--|------------|--|---------|
| | | | | |
| Too Small | | Just Right | | Too Big |

If the Size of the Touch Areas was not Just Right, please explain how it should be different:

Touch Sensitivity - The touch screen was sensitive enough that only one touch was required to select a touch area.

| | | | | |
|---------------|--|------------|--|----------------------|
| | | | | |
| Too Sensitive | | Just Right | | Not Sensitive Enough |

If the Touch Sensitivity was not Just Right, please explain how it should be different:

Clipboard Touch Screen Configuration (continued)

Touch Key Arrangement - The arrangement of the touch keys was appropriate for me to use the Clipboard.

Hard to Use Easy to Use

If the Arrangement of the Touch Keys did not make them Easy to Use, please explain how it should be different:

Touch Screen Menus (Understandability) - The menus presented on the touch screen were appropriate for me to use the Clipboard operating modes and databases.

Easy to Understand Hard to Understand

If the Touch Screen Menus were not Easy to Understand, please explain how they should be different:

Clipboard Touch Screen Configuration (continued)

Touch Screen Menus - (Useability) The menus presented on the touch screen were clear and understandable, and appropriate for me to access the Clipboard operating modes and databases.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Hard to Use Easy to Use

If the wording or organization of the Touch Screen Menus did not make them Easy to Use, please explain how it should be different:

Clipboard Display

Brightness -

The display brightness was appropriate for me to use the Clipboard.

| | | | | |
|------------|--|------------|--|---------|
| | | | | |
| Too Bright | | Just Right | | Too Dim |

If the Display Brightness was not Just Right, please explain how it should be different:

Letter Size -

The size of the letters and numbers on the display was appropriate for me to use the Clipboard.

| | | | | |
|-----------|--|------------|--|---------|
| | | | | |
| Too Small | | Just Right | | Too Big |

If the Letter Size was not Just Right, please explain how it should be different:

Clipboard Display (continued)

**Display Legibility -
(Daylight)**

The legibility of the text and characters shown on the display was appropriate for me to use the Clipboard during the day.

| | | | | |
|-------------|--|--|--|--------------|
| | | | | |
| Not Legible | | | | Very Legible |

If the text and characters shown on the screen were not Very Legible during the day, please explain the problem(s) observed:

**Display Legibility -
(Nighttime)**

The legibility of the text and characters shown on the display was appropriate for me to use the Clipboard at night.

| | | | | |
|-------------|--|--|--|--------------|
| | | | | |
| Not Legible | | | | Very Legible |

If the text and characters shown on the screen were not Very Legible at night, please explain the problem(s) observed:

Clipboard Functions

ID the Evaluator - The Clipboard functions were appropriate for me to identify the evaluator(s).

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the ID the Evaluator Function was not Easy to Use, please explain how it should be different:

ID the Student - The Clipboard functions were appropriate for me to identify the student(s).

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the ID the Student Function was not Easy to Use, please explain how it should be different:

Clipboard Functions (continued)

ID the Drill -

The Clipboard functions were appropriate for me to identify the drill(s).

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the ID the Drill Function was not Easy to Use, please explain how it should be different:

Train on a Drill -

The Clipboard functions were appropriate for me to train the drill(s) in the field.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the Train on a Drill Function was not Easy to Use, please explain how it should be different:

Clipboard Functions (continued)

Evaluate a Drill -

The Clipboard functions were appropriate for me to evaluate the drill(s) in the field.

| | | | | |
|------------------|--|--|--|-------------|
| | | | | |
| Difficult to Use | | | | Easy to Use |

If the Evaluate a Drill Function was not Easy to Use, please explain how it should be different:

Review a Pass -

The Clipboard functions were appropriate for me to review the student(s) scores.

| | | | | |
|------------------|--|--|--|-------------|
| | | | | |
| Difficult to Use | | | | Easy to Use |

If the Review a Pass Function was not Easy to Use, please explain how it should be different:

Clipboard Functions (continued)

**Entry Correction/ -
Cancellation**

The Clipboard functions were appropriate for me to correct or cancel any entries that I made.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the Entry Correction/Cancellation was not Easy to Use, please explain how it should be different:

| |
|--|
| |
| |
| |
| |
| |

Scroll Up/Down -

The Clipboard functions were appropriate for me to scroll up and down within a list.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the Scroll Up/Down was not Easy to Use, please explain how it should be different:

| |
|--|
| |
| |
| |
| |
| |

Clipboard Functions (continued)

Go/No Go - The Clipboard functions were appropriate for me to identify
Not Seen/Not Done the tasks that were GO, NO GO, NOT SEEN, or NOT
DONE.

| | | | | |
|------------------|--|--|-------------|--|
| | | | | |
| Difficult to Use | | | Easy to Use | |

If the Go, No/Go, Not Seen/Not Done functions were not Easy to Use,
please explain how they should be different:

Stopwatch -
(Usability)

The Stopwatch function was appropriate for me to time
events.

| | | | | |
|------------------|--|--|-------------|--|
| | | | | |
| Difficult to Use | | | Easy to Use | |

If the Stopwatch was not Easy to Use, please explain how it should be different:

**Stopwatch -
(Adequacy)**

The Stopwatch function was appropriate for me to time events.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Adequate

Not Adequate

If the Stopwatch was not Adequate for timing events, please explain how it should be different:

**Operating Time -
Remaining**

The Clipboard functions were appropriate for me to determine the operating time remaining.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the Operating Time Remaining was not Easy to Use, please explain how it should be different:

Clipboard Functions (continued)

Date/Time -

The Clipboard functions were appropriate for me to use the calendar and clock.

| | | | | |
|------------------|--|--|--|-------------|
| | | | | |
| Difficult to Use | | | | Easy to Use |

If the Date/Time was not Easy to Use, please explain how it should be different:

Automatic OFF -

The display turns off automatically after 3 minutes if no key is pressed. This function was adequate for me to use the Clipboard .

| | | | | |
|------------------------|--|--|--|-------------------------------|
| | | | | |
| Interfered with my job | | | | Did not interfere with my job |

If the Automatic OFF interfered with your job, please explain how it should be different:

Overall Useability

Please rate the overall useability of the Clipboard under the following conditions.

Rate each question, using numbers from 0 to 5, as follows:

| | | | | |
|------------------|---|---|---|-----------------------|
| 1 | 2 | 3 | 4 | 5 |
| Very Easy to Use | | | | Very Difficult to Use |

| Condition | Rating | Comments |
|--|--------|-------------------------|
| Daytime | _____ | _____ _____ _____ |
| Nighttime | _____ | _____ _____ _____ |
| Evaluating Mobile Forces | _____ | _____ _____ _____ |
| Evaluating Stationary Forces | _____ | _____ _____ _____ |
| Evaluating Discrete Events | _____ | _____ _____ _____ |
| Evaluating Events in a Series of other Events | _____ | _____ _____ _____ |
| Field Environment (e.g., heat, humidity, mud) | _____ | _____ _____ |

Training Base Station (IBM Computer) Functions

**Set ECS Initial -
Conditions
(Enter Evaluator
Names)**

**The Training Base Station functions were appropriate for
me to set the initial conditions - Enter Evaluator Names.**

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use Easy to Use

**If the Set ECS Initial Conditions Function - Enter Evaluator Names was
not Easy to Use, please explain how it should be different:**

**Set ECS Initial -
Conditions
(Enter Soldier
Names)**

**The Training Base Station functions were appropriate for
me to set the initial conditions - Enter Soldier Names.**

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use Easy to Use

**If the Set ECS Initial Conditions Function - Enter Soldier Names was
not Easy to Use, please explain how it should be different:**

Training Base Station Functions (continued)

**Set ECS Initial -
Conditions
(Select Training
Guide)**

The Training Base Station functions were appropriate for me to set the initial conditions - Select Training Guide.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the Set ECS Initial Conditions Function - Select Training Guide was not Easy to Use, please explain how it should be different:

**Diagnose ECS -
Status**

The Training Base Station functions were appropriate for me to diagnose the ECS operational status.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the Diagnose ECS Status Function was not Easy to Use, please explain how it should be different:

Training Base Station Functions (continued)

**Transfer ECS -
Conditions to
Clipboard**

The Training Base Station functions were appropriate for me to transfer the initial conditions to the Electronic Clipboard.

| | | | | |
|------------------|--|--|--|-------------|
| | | | | |
| Difficult to Use | | | | Easy to Use |

If the Transfer ECS Initial Conditions to Clipboard Function was not Easy to Use, please explain how it should be different:

**Upload -
Training Data**

The Training Base Station functions were appropriate for me to upload scores from the Clipboard.

| | | | | |
|------------------|--|--|--|-------------|
| | | | | |
| Difficult to Use | | | | Easy to Use |

If the Upload Training Data Function was not Easy to Use, please explain how it should be different:

Training Base Station Functions (continued)

**Display of -
Summary Reports**

The displayed presentation of summary score reports was appropriate for me to do my job.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Difficult to Use

Easy to Use

If the Display of Summary Data was not Easy to Use, please explain how it should be different:

**Entry Correction/ -
Cancellation**

The Training Base Station functions were appropriate for me to correct or cancel any entries that I made.

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

Too Complicated

Just Right

Very Unclear

If the Entry Correction/Cancellation was not Just Right, please explain how it should be different:

Training Base Station Functions (continued)

**ECS - TBS
Connection**

- The connection between the Electronic Clipboard and the Training Base Station was appropriate for me to successfully connect the two devices.

| | | | |
Too Complicated Just Right Very Unclear

If the ECS - TBS Connection was not Just Right, please explain how it should be different:

**TBS Menu -
Options
(Useability)**

The Training Base Station menu options were appropriate for me to do my job.

| | | | |
Difficult to Use Easy to Use

If the TBS Menu Options were not Easy to Use, please explain how they should be different:

Training Base Station Functions (continued)

**TBS Menu -
Options
(Adequacy)**

The Training Base Station menu options were appropriate
for me to select the options I wanted.

| | | | | |
|----------|--|--|--|--------------|
| | | | | |
| Adequate | | | | Not Adequate |

If the TBS Menu Options were not Adequate, please explain how they should be different:

Open Ended TIMS Evaluation Questions

If you could change the Clipboard in any way, what would you do?

In what other training situations do you think the Clipboard could be used effectively?

Open Ended TIMS Evaluation Questions (continued)

In what other evaluation situations do you think the Clipboard could be used effectively?
